ACI Committee Document
Abstracts

The following ACI documents are, or will soon be, available:

"Contraction Joints in Residential Slabs-on-Ground—TechNote (ACI PRC-224.5-22)"

Reported by ACI Committee 224, Cracking

Jacob K. Bice, Chair; Ralf Leistikow, Secretary; James Peter Barlow, Florian G. Barth, Neal S. Berke, Peter H. Bischoff, David Darwin, John F. Duntemann, Christopher C. Ferraro, Fouad H. Fouad, David W. Fowler, Robert J. Frosch, Grant T. Halvorsen, Will Hansen, Harvey H. Haynes, Mohammad Iqbal, Malcolm K. Lim, Edward G. Nawy, Kamran M. Nemati, Keith A. Pashina, Guillermo Alberto Riveros, Ernest K. Schrader, and Jeffrey S. West, Members; Royce J. Rhoads, Andrew Scanlon, and Andrea J. Schokker, Consulting Members.

Abstract: This TechNote informs licensed design professionals that contraction joints are required by ACI 332, "Code Requirements for Residential Concrete," in plain and reinforced concrete residential slabs and provides guidance regarding factors that influence joint layout. For post-tensioned slabs, installation of contraction joints is optional and at the discretion of the licensed design professional. However, using joints will be beneficial, as random cracks will be minimized.

"Compaction of Roller-Compacted Concrete—Report (ACI PRC-309.5-22)"

Reported by ACI Committee 309, Consolidation of Concrete

Eamonn F. Connolly, Chair; Timothy P. Dolin, Christopher John Eagon, Chiara F. Ferraris, Dimitri Feys, John F. Gibbons, Vincent E. Hunt, Paul Jaworski, Hoa Lam, Patrick F. O'Brien Jr., Larry D. Olson, H. Celik Ozyildirim, Steven A. Ragan, and Luke A. Sevcik, Members; Jerome H. Ford, Consulting Member.

Abstract: Roller-compacted concrete (RCC) is an accepted and economical method for the construction of dams and pavements. Achieving adequate compaction is essential to the development of the desired properties in the hardened material. The compaction depends on many variables, including the strength of the subbase, materials used in RCC, mixture design proportions, mixing and transporting methods, discharge and spreading practices, compaction equipment and procedures, and lift thickness. The best performance characteristics are obtained when the concrete is reasonably free of segregation; well-bonded at construction joints; and compacted at, or close to, maximum density.

This report summarizes the experience in compaction of RCC in various applications and offers guidance in the selection of equipment and procedures for compaction, as well as for quality control of the work. Compaction equipment and procedures should be appropriate for the work. In dam or massive concrete applications, large, self-propelled, smooth, steel-drum vibratory rollers are most commonly used. The frequency and amplitude of the roller should be suited to the mixture and lift thickness required for the work. Other roller parameters, such as static mass, number of drums, diameter, ratio of frame and drum mass, speed, and drum drive influence the rate and effectiveness of the compaction equipment. Smaller equipment, and possibly thinner compacted lifts, are required for areas where access is limited.

Pavements are generally placed with paving machines that produce a smooth surface and some initial compacted density. Final density is obtained with vibratory rollers. Rubber-tired rollers can also be used where surface tearing and cracks would occur from steel-drum rolling. The rubber-tired rollers close fissures and tighten the surface.

Inspection during placement and compaction is also essential to ensure the concrete is free of segregation before compaction and receives adequate coverage by the compaction equipment. Testing is then performed on the compacted concrete on a regular basis to confirm that satisfactory density is consistently achieved. Corrective action

should be taken whenever unsatisfactory results are obtained. RCC offers a rapid and economical method of construction where compaction practices and equipment are a major consideration in both design and construction.

"Concrete Shell Structures—Guide (ACI PRC-334.1-22)"

Reported by Joint ACI-ASCE Committee 334, Concrete Shell Design and Construction

Robert B. Esplin, Chair; Bryan S. Butikofer, Benjamin Davis, Charles S. Hanskat, Takashi Hara, Brent K. Hardy, Michael D. Hunter, Samaan Ladkany, Ryan Partridge, Ryan E. Poole, Theodore J. Smulski, Andrew J. South, Jason P. South, Mark E. Williams, and Chris S. Zweifel, Members; John F. Abel, Arthur J. Boyt Jr., James L. Byrne, Frederick L. Crandall, Charles W. Dolan, Phillip L. Gould, Ajaya Kumar Gupta, Mark Allen Ketchum, Lei Lou, John C. Miller, Thomas E. Nelson Jr., John M. Rotter, William C. Schnobrich, Barry South, David B. South, Bing-Yuan Ting, and Arnold Wilson, Consulting Members.

The committee acknowledges associate member Z. Wells for contributing to this guide.

Abstract: This guide discusses the practical aspects of shell design, including recommendations for designers of thin concrete shells. General guidance based on current practice is given on analysis, proportioning, reinforcement, and construction. A selected bibliography on analytical methods, featuring design tables and aids, is included to assist the engineer.

"Measuring Shrinkage, Creep, and Transport Properties of Fiber-Reinforced Concrete—Report (ACI PRC-544.11-22)"

Reported by ACI Committee 544, Fiber Reinforced Concrete

Liberato Ferrara*, Chair; Neven Krstulovic-Opara, Secretary; Clifford N. MacDonald, Membership Secretary; Corina-Maria Aldea*, Salah Ahmed Altoubat, Emmanuel K. Attiogbe, Mehdi Bakhshi*, Nemkumar Banthia*, Joaquim Oliveira Barros, Amir Bonakdar†, Amanda C. Bordelon, Jean-Philippe Charron*, Xavier Destree, Ashish Dubey, Mahmut Ekenel, Alessandro P. Fantilli, Gregor D. Fischer, Dean P. Forgeron, Emilio Garcia Taengua*, Rishi Gupta, Heidi Helmink, David A. Lange, Michael A. Mahoney, Bruno Massicotte, James Milligan, Nicholas C. Mitchell Jr., Barzin Mobasher*, Verya Nasri, Giovanni A. Plizzari, Klaus Alexander Rieder, Pierre Rossi, Steve Schaef*, Surendra P. Shah, Flavio de Andrade Silva, Luca Sorelli, Hendrik Thooft, Thomas E. West Jr., Kay Wille, and Robert C. Zellers, Members; P.N. Balaguru, Hiram Price Ball Jr., Gordon B. Batson, Arnon Bentur, Andrzej M. Brandt, James I. Daniel, Sidney Freedman, Christian Meyer, Antoine E. Naaman, and Venkataswamy Ramakrishnan, Consulting Members.

*Members of Task Group who prepared this report.

†Chair of the Task Group who prepared this report.

Abstract: Fiber-reinforced concrete (FRC) has become a viable choice for many designers and builders for the unique properties and advantages it provides. From slabs-on-ground to underground structures, the use of FRC has been expanding in concrete construction. This growth of applications has created the need to review the existing test methods for FRC and, where necessary, develop new ones. Two reports (ACI 544.2R and ACI 544.9R) have already been published regarding testing fresh properties and mechanical properties of FRC, respectively. This report is the third and final report on testing FRC for its durability properties, including shrinkage, creep, and permeability. Several standard and nonstandard test methods are presented in this report to represent some of the knowledge in this area.

"Design and Construction with Insulating Concrete Forms (ICFs)—Report (ACI PRC-560-22)"

Reported by ACI Committee 560, Design and Construction with Insulating Concrete Forms

Robert C. Rogers, Chair; Robert E. Sculthorpe, Chair of last incremental update; James A. Farny, Secretary; Douglas Bennion, Scott Campbell, David H. DeValve, Kelvin L. Doerr, Brian C. Gerber, Anthony I. Johnson, Adam Knaack, James A. Lane, Lionel A. Lemay, Kenneth A. Luttrell, Kevin A. MacDonald, Craig McKee, Patrick F. O'Brien, Kevin C. Rector, Robert C. Rogers, Michael H. Weber, and Carla V. Yland, Members; Curtis Westbrook, Consulting Member.

Abstract: Insulating concrete forms (ICFs) are leave-in-place forms typically produced in block or panel shapes of expanded polystyrene (EPS). They provide additional components, such as insulation and a substrate for interior and exterior finish attachment, for a wall or floor system. The most widely used ICFs are block shapes, which are stacked in an interlocking fashion to create stable formwork for placement of reinforced concrete walls. Due to the variability of these manufactured form systems, this report does not attempt to address every ICF type, but provides a commentary on those systems most prevalent in the market, and insight, as well as additional information, relative to their use in design and construction. The report focuses on ICFs for walls.